STUDIES IN THE LIABEAE (ASTERACEAE). X.

ADDITIONS TO THE GENUS *PARANEPHELIUS*

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The genus *Paranephelius* has been represented in the literature by five species ranging from northern Peru to southern Bolivia (Robinson & Brettell, 1974). The genus is distinct among the Liabeae by the basal rosette of leaves surrounding a single sessile head or a group of 2-3 heads. The habit is shared by other genera of Compositae in the Andes including *Werneria* and a few species of *Senecio* in the tribe Senecioneae and some species of *Hypochaeris* of the Lactuceae, Specimens of the latter two genera have been encountered in collections annotated to species of *Paranephelius* and the most obvious differences are worth mentioning. *Werneria* and *Senecio* can be distinguished by the valvate involucre and by the glabrous short-lobed disk corollas. *Hypochaeris* can be distinguished by the ligulate corollas but perhaps even more readily in most specimens by the plumose pappus setae. The four genera are sometimes mixed in collections.

The present range of *Paranephelius* excludes Ecuador but the proximity of known sites indicates that the genus will probably be found on the botanically nearly unknown southernmost mountains of Loja and Zamora.

Attempts to determine specimens on loan from other herbaria have shown the need to clarify some species limits in the genus, and two species, *P. ferreyrii* and *P. wurdackii* are described here as new.

The value of some characters is in question. As in other genera of the Liabeae the pubescence of the upper leaf surface has been found almost totally unreliable. Tomentum on the outer surfaces of the ray flowers has been mentioned as a species character by Weddell (1855), being dense in *P. bullatus* A.Gray ex Wedd., sparse in *P. uniflorus* P.& E., and supposedly lacking in *P. ovatus* Wedd. The latter species does show only slight tomentum on the rays of most specimens, but tomentum is apparently present in all the species of the genus. On younger rays the tomentum is usually dense, but tomentum may not be

obvious on the fully expanded mature corollas. Such tomentum is not found on the rays of other genera in the Liabeae. Many species show dense clusters of fusiform lateral roots. These are common in simple-leaved specimens of P. uniflorus, in specimens seen of P. bullatus, in P. wurdackii, and in one specimen of P. asperifolius (Muschl.) R.& B. Fusiform lateral roots seem comparatively sparse or lacking in P. ovatus, P. jelskii (Hieron.) R.& B., and in dissected-leaved P. uniflorus. No such roots have been seen in P. ferreyrii. These differences in roots might reflect differences in collecting techniques. It seems likely that fusiform roots are common to all members of the genus, but specimens should be carefully examined in the field.

A problem has been noted in the distinction of two species with obtuse or blunt-tipped outer involucral bracts. The type species, P. uniflorus, was described and illustrated with pinnately lobed leaves while P. ovatus was described with simple ovate to rhomboid leaf blades having a smooth upper surface. Collections with simple leaf blades have generally been placed in P. ovatus even if the upper surface was rough. A review of specimens shows a distinction of P. ovatus on the basis of the smooth leaf with veins often prominulous, being depressed only in distorted material. The upper surface is usually glabrous but some Bolivian specimens are pilose above. Secondary veins of the leaves seem particularly close and straight.

Specimens called P. ovatus with rough upper leaf surfaces cannot be distinquished satisfactorily from a series of specimens of P. uniflorus showing leaf blades lobed only at the base, and they are here regarded as representatives of that species. Within the expanded concept of P. uniflorus there is some tomentum or even some setae on the achenes in specimens from northern Peru with lobed leaves, but achenes of other lobed specimens and all unlobed specimens seem glabrous.

A species with lobed leaves in Bolivia. P. asperifolius, seems to account for early reports of P. uniflorus in that country. The name has been used for some specimens of P. ovatus with pilose upper leaf surfaces, but the latter character varies in both species. The leaf shape of P. asperifolius is consistently lobed in all specimens seen and correlates with the involucre having all bracts narrow and acute.

Species of Paranephelius having acute outer involucral bracts are most common in northern Peru.

These include the following two previously undescribed species.

Paranephelius ferreyrii H.Robinson, new species

Plantae herbaceae acaulescentes; radices fusiformes non visa. Folia rosulata basalia oblanceolata pinnatifida usque ad 6 cm longa et 2 cm lata base anguste petioliformia apice obtusa vel rotundata margine obtuse serrata vel duplo-serrata supra valde bullata sparse pilosa et evanescentiter sparse arachnoideo-tomentosa subtus albo-tomentosa in nervis interdum fulvo-pilosa, lobis utrinque 2-4 ovatis vel oblongis. Capitula sessilia plerumque solitaria 17-18 mm alta et 13-15 mm lata; squamae involucri 40-50 ca. 4-seriatae ovato-lanceolatae vel lineari-lanceolatae 5-9 mm longae et 1-2 mm latae margine vix scariosae superne dense puberulae apice anguste argute acutae extus distincte pilosae et evanescentiter tomentosae. Flores radii 19-29; corollae flavae, tubis ca. 8 mm longis superne hirsutis, limbis ca. 15 mm longis et 2.5 mm latis inferne hirsutis extus distincte tomentosis et sparse glandulo-hirsutis. Flores disci ca. 20-35; corollae flavae, tubis 9-10 mm longis superne minute puberulis, faucis ca. 1.5 mm longis extus puberulis, lobis ca. 2.5 mm longis ad apicem stipitato-glandulosis; filamenta antherarum in parte superiore ca. 0.4 mm longa; thecae ca. 2.5 mm longae; appendices antherarum ca. 1.2 mm longae. Achaenia immatura 3.5 mm longa sparse tomentosa et sparse setifera; setae pappi 2-3-seriatae 45-50 interiores usque ad 10 mm longae, setae longiores apice aliquantum latiores, setae exteriores breviores ca. 10-15 plerumque 1.5-4.0 mm longae. Grana pollinis plerumque 35-42μ diam.

TYPE: PERU: Cajamarca: Cajamarca; Cumbre el Gavilan, Carretera Cajamarca-Chilete. Alt. 3200 m. Habitat arcilloso. Hierba, flores amarillas. Marzo 31, 1948. R.Ferreyra 3311 (Holotype, US). PARATYPE: PERU: Cajamarca: Banos. V 1958. J.Soukup 4642 (US).

Paranephelius ferreyrii is most closely related to P. bullatus which it closely resembles in the size of the head, the bullate upper surface of the leaves, and the achenes with setae as well as tomentum. The new species differs most obviously by the pinnately lobed leaves and less obviously by the slightly but more distinctly enlarged tips of the longer pappus setae. Two specimens seen that apparently represent P. bullatus (Mito, Macbride & Featherstone 1656; 15 mi. SE of Huanuco, Macbride & Featherstone 2131) have simple leaf blades with rather strongly ascending secondary veins. Paranephelius bullatus was originally

described with obtuse outer involucral bracts but the two specimens seen show outermost bracts with digitately lobed tips and some short-acute to obtuse bracts in the next series. The new species has the bracts all narrowed to acute tips. The bracts in P. bullatus seem to differ also by the lack of coarse hairs on the outer surface.

Setae on the achenes have been noted thus far in the genus only in P. ferreyrii, P. bullatus, and in some specimens of P. uniflorus.

Paranephelius wurdackii H.Robinson, new species

Plantae herbaceae acaulescentes; radices fusiformes fasciculatae distinctae. Folia rosulata basalia obovata base petioliformia; laminae late ellipticae inferne subtiliter lobatae apice obtusae vel late acutae margine grosso-serratae vel duplo-serratae supra leaves pilosae subtus albo-tomentosae in nervis non tomentosae et sparse pilosae. Capitula sessilia solitaria ca. 3 cm alta et 3.5 cm lata base in zona brevi dense hirsuta; squamae involucri ca. 45 ca. 3-4-seriatae 15-23 mm longae et 1.5-5.0 mm latae margine distincte anguste scariosae, exteriores anguste subtiliter obpanduriformes apice acutae extus pilosae interiores lineari-oblongae vel lineari-lanceolatae apice anguste acutae vel longe attenuatae extus glabrae vel subglabrae solum in squamis exteriissimis pauce tomentosae. Flores radii ca. 35; corollae flavae, tubis 15-20 mm longis superne hirsutis, limbis ca. 40 mm longis et 4 mm latis inferne hirsutis extus tomentosis et glandulo-hirsutis et sparse glandulo-punctatis. Flores disci ca. 35; corollae flavae, tubis ca. 17 mm longis superne puberulis, faucis 2 mm longis indistinctis puberulis, lobis 3 mm longis glabris apice minute appendiculatis; filamenta antherarum in parte superiore ca. 0.8 mm longa; theca ca. 3 mm longa; appendices 0.4-0.5 mm longae. Achaenia immatura ca. 3 mm longa sparse tomentosa; setae pappi ca. 75-80 plerumque 15-20 mm longae apice non latiores, setae exteriores breviores paucae. Grana pollinis ca. 40-42 μ diam.

TYPE: PERU: Amazonas: Prov. Chachapoyas; open cold swamp on summit of Cerros de Calla-Calla, between Leimebamba-Balsas road pass and the camino de herradura (2 hours walk south), elev. 3500-3750 m. 8 July 1962. J.J.Wurdack 1240 (Holotype, US).

A series of specimens collected in 1962 by J.J. Wurdack from near Chachapoyas in Amazonas, Peru consists mostly of material identified as Paranephelius jelskii. One of the collections contains one

specimen of a closely related but distinct species named here as P. wurdackii. The distinctions of the new species include a slight but distinct lobing of the basal part of the lamina, some pilosity and no tomentum below on the main veins of the leaves, no evident tomentum on the main bracts of the involucre, and no glands on the tips of the disk corolla lobes. There is a distinctive cluster of short-stalked glands near the tips of the disk corolla lobes of specimens seen of P. jelskii. There are a few long-stalked glands on the lobes in most specimens seen of P. uniflorus and P. ovatus. The type of P. jelskii from Cutervo in Dept. Cajamarca, Peru has not been seen, but a photograph is available showing the leaf shape and complete tomentosity of the leaf undersurface as in the Wurdack collections under that name. The involucres of the Wurdack collections are almost completely covered with dense tomentum but the type apparently has tomentum less dense. Vestiture of the disk corolla lobes cannot be seen and was not mentioned in the original description.

Paranephelius wurdackii seems distinctive in the large size of the head and the floral parts. The lobes of the disk corollas are more pointed than in other species partly due to the small but distinct appendage on the tip.

Both species collected by Wurdack share a rather distinctive form of hair on the achene. The long hairs consist of a short basal flexible zone with thin-walled cells followed by a straight portion of 2-3 elongate firm-walled cells. The apex of the hair is attenuated into an indefinitely elongate contorted arachnoid portion forming at least part of the tomentum of the achene.

Literature Cited

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